

REMARKS

The present invention is drawn to a method of promoting acid-neutralization in a cylinder oil for engines of ships (Claim 6) and a method comprising lubricating a ship engine with a cylinder oil (Claim 7). The method includes adding to the oil an acid-neutralizing promoter which comprises a succinimide component obtainable by reacting diethylene triamine having a resulting carbon/nitrogen weight ratio of 1.14 with a particular succinic acid compound.

The comparative data in the specification demonstrates the importance of the above-discussed carbon/nitrogen weight ratio but having a maximum of 1.25. Compare the data for Examples 1-4 with the data for Comparative Example 1, in Table 1-1 and Table 1-2, at page 19 of the specification. The examples and comparative example (as well as the other comparative examples) were subjected to both an acid neutralization capability test and a stability test, as described in the specification at page 15, line 4 through page 16, line 3. The examples produced a substantially larger pressure increase, meaning a higher corrosion, wear-resisting ability, compared to the comparative example. In addition, in the stability test, the stored sample of the examples gave no precipitate, while the stored sample of the comparative example gave some precipitate.

The presently-recited carbon/nitrogen weight ratio of 1.14 is further demonstrated to provide non-obvious results when the following is considered.

The data from Table 1-1 for Example 1 and Example 4, which is now a Comparative Example in view of the above-discussed amendment, is reproduced below in Table A with additional data for internal pressure increase after 20 seconds:

Table A

	Example 1	Example 4 (Comp. Ex.)
Number-average molecular weight of polybutenyl group	1,000	1,000
Polyamine (C/N weight ratio)	Diethylenetriamine 1.14	Ethylenediamine 0.86
Succinic acid/Polyamine (molar ratio)	1.0	1.0
Succinimide (wt.%)	0.5	0.5
Ca sulfonate (TBN 510) (wt.%)	14.0	14.0
Internal pressure increase after 20 seconds (kg/cm <sup>2</sup> )	2.92	2.10
Internal pressure increase after 30 seconds (kg/cm <sup>2</sup> )	2.92	2.60
Stability test	0	0

As shown by Table A, the internal pressure increase (kg/cm<sup>2</sup>) after 20 seconds and 30 seconds in Example 1 are both 2.92 , meaning that an acid neutralization reaction is completed in 20 seconds. In contrast thereto, the internal pressure increase (kg/cm<sup>2</sup>) after 20 seconds and 30 seconds in Example 4 are 2.10 and 2.60, respectively. In other words, the sample of Example 1 has a higher corrosion, wear-resisting ability than Example 4.

The above discussed results could not have been predicted by the applied prior art.

The rejection of Claims 6, 7 and 10-17 under 35 U.S.C. § 103(a) as unpatentable over U.S. 4,375,418 (Zoleski et al), is respectfully traversed.

Zoleski et al disclose a lubricating oil composition for use in medium and high speed marine diesel engine crank cases and having a total base number from about 5 to 40, and containing, *inter alia*, a mineral lubricating oil; about 0.1-5, preferably about 0.5-2.0, weight % of an over based calcium sulfonate (paragraph bridging columns 2 and 3); 0.1-7 weight % of an over based sulfurized calcium phenate (paragraph bridging columns 4 and 5); and an alkenyl succinimide. While the alkenyl succinimide may be derived from an amine having from 2 to 12 nitrogen atoms, i.e., x is from 0 to 10 in the formula at column 2, lines 53-63,

Zoleski et al discloses that x is preferably 3 or 4 or mixtures thereof (column 4, lines 17-18).

When x is 3, the carbon/nitrogen weight ratio is necessarily 1.37; when x is 4, the ratio is necessarily 1.42. Thus, the preferred alkenyl succinimide embodiments of Zoleski et al are outside the terms of the present claims, which require such ratio of 1.14. Zoleski et al do not specifically disclose any polyamines having a carbon/nitrogen weight ratio of 1.14. The particular working examples of Zoleski et al do not specify the chemical structure of their alkenyl succinimide beyond disclosing that it is derived from a polyamine. See Table I, footnote (3). In addition, Zoleski et al generally employ less than the minimum 10% by weight amount of present component (a), even if their over based sulfurized calcium phenate could be construed as overlapping the presently-recited over based phenate. The particular working examples of Zoleski et al employ 4.65% by weight of their over based sulfurized calcium phenate and 1.83% by weight of their over based calcium sulfonate. See Table I, footnotes (4) and (5).

In the present Office Action, the Examiner notes that prior art references are to be considered for all subject matter fairly disclosed either alone or together for what they teach the worker of ordinary skill in the art and thus, Zoleski et al is not limited to specific examples or preferred teachings, and furthermore, to the extent Applicants are relying on comparative data to show unexpected results, the results must be shown to have been unexpected and that they be commensurate in scope with the claims.

In reply, Applicants do not dispute the Examiner's statement of the law, except that any showing of unexpected results must be commensurate in scope with only so much of the claimed invention that is *prima facie* obvious, which is not necessarily the full scope of any particular claim. As discussed above, while Zoleski et al disclose a value of x of from 0 to 10, Zoleski et al prefers a value of x of 3 or 4. The above-discussed comparative data, on the other hand, demonstrates that results are better when outside the preferred range of x of

Zoleski et al. One would clearly understand that a result for a non-preferred embodiment that is better than the result for a preferred embodiment is necessarily unexpected.

If the Examiner continues to maintain the above rejection, the Examiner is requested to identify what in Zoleski et al is considered to be the closest prior art to the presently-claimed invention, and to specifically respond to the above argument that a result for a non-preferred embodiment that is better than the result for a preferred embodiment is necessarily unexpected.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

The rejection of Claims 6, 7 and 10-17 under 35 U.S.C. § 103(a) as unpatentable over Zoleski et al in view of U.S. 3,172,892 (LeSuer et al) and EP 0839894 (Katafuchi), is respectfully traversed.

The disclosures and deficiencies of Zoleski et al have been discussed above. The combination of Katafuchi and LeSuer et al does not remedy these deficiencies. Katafuchi requires a bis-type succinic imide compound. Comparative Example 2 therein demonstrates that when a mono-type alkenyl succinic imide is used in place of the bis-type alkenyl succinic imide of his invention, inferior results are obtained with regard to the stability test described at page 7 therein. See Table 1 therein. Thus, if one skilled in the art were to combine Katafuchi with Zoleski et al, one skilled in the art would choose the bis-type succinic imide compound of Katafuchi. The Examiner cannot simply choose from Katafuchi those disclosures that support the rejection, but ignore teachings against it.

LeSuer et al has been relied on only for its disclosure of a process for preparation of alkenyl succinamide dispersants. As the Examiner notes, Zoleski et al refers to LeSuer et al. While LeSuer et al exemplifies using polyamines within the present claims, LeSuer et al also exemplifies using polyamines outside the terms of the present claims. LeSuer et al discloses

nothing that detracts from Zoleski et al's disclosed preference of polyamines outside the terms of the present claims.

In the present Office Action, the Examiner finds that the above argument that one skilled in the art would choose the bis-type alkenyl succinic imide compound of Katafuchi "as speculative and ignores the teachings of Zoleski et al. Further, Applicants' argument, if accepted, would improperly remove the teachings of Zoleski et al from the available prior art."

In reply, the above argument, if accepted, would **not** remove Zoleski et al's prior art teachings. The Examiner concludes that one of ordinary skill in the art would combine Zoleski et al with Katafuchi. But this **combination** is **not** in the prior art. While Applicants submit that one skilled in the art would not combine Zoleski et al and Katafuchi, nevertheless, if this prior art were combined, the result would be the use of Katafuchi's bis-type alkenyl succinic imide compound, demonstrated by Katafuchi to be better than a corresponding mono-type alkenyl succinic imide. Such a result does **not** remove Zoleski et al's teachings from the prior art.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

The rejection of Claims 6, 7 and 10-17 under 35 U.S.C. § 103(a) as unpatentable over Vinci et al in view of Katafuchi, is respectfully traversed. Vinci et al disclose a lubricating oil containing a base oil, at least one ashless dispersant, and a particular demulsifier. Vinci et al disclose that many types of ashless dispersants are known in the prior art, and any of these is suitable for use in their invention (sentence bridging columns 5 and 6). Vinci et al then devote the disclosure following this sentence through column 25, line 37, describing applicable ashless dispersants. As noted by the Examiner, Example B-1 and Example B-2 appear to meet the terms of the presently-recited succinimide component. However, other examples are outside the terms of the present succinimide component, such as Example B-5,

which uses tetraethylene pentamine, precisely the polyamine used in Comparative Example 1 of the specification, discussed above. Thus, Vinci et al make no distinction between any of the many ashless dispersants within their broad disclosure. In addition, Vinci et al disclose and suggest nothing with regard to acid-neutralizing promoter, the presence of an acid-neutralizing promoter, or a total base number of their lubricating oil.

The Examiner relies on Katafuchi for his disclosure of over based sulfonates, phenates, and salicylates of alkaline earth metals but, as discussed above, ignores Katafuchi's disclosure of bis-type succinic imide compounds. Thus, if one skilled in the art were to combine Katafuchi with Vinci et al, one skilled in the art would choose the bis-type succinic imide compound of Katafuchi. As pointed out above, the Examiner cannot simply choose from Katafuchi those disclosures that support the rejection, but ignore teachings against it.

In the present Office Action, the Examiner treats the above argument as if Vinci et al were anticipatory. It is not. Therefore, the Examiner cannot ignore the above argument that Vinci et al recognizes no distinction among their relatively large and varied genus of ashless dispersants, and the above-discussed comparative data demonstrating that in the environment of the present claims, the type of acid-neutralizing promoter used is important.

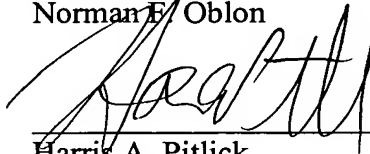
For all the above reasons, it is respectfully requested that this rejection be withdrawn.

Application No. 10/068,860  
Reply to Office Action of April 27, 2004

All of the presently pending claims in this application are now believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read "H. Pitlick", is written over a horizontal line.

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